

REMARKS

Reconsideration of the above-referenced application in view of the above amendment, and of the following remarks, is respectfully requested.

Claims 1-6 and 21 are pending in this case. Claim 21 is added herein and claims 7-20 are cancelled herein as they are directed to non-elected inventions.

The Examiner rejected claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama et al. (U.S. Patent 6,831,313) in view of Fox et al. (U.S. Patent 6,627,930).

Applicant respectfully submits that claim 1 is patentable over Uchiyama et al in view of Fox et al as there is no disclosure or suggestion of a single ferroelectric core layer with a crystallization in the (001) family, wherein at least 40% of the domains of the single ferroelectric core layer are functionally oriented with respect to the capacitor stack. As noted by the Examiner, Uchiyama fails to disclose or suggestion this limitation. Fox teaches a ferroelectric core layer having a crystallization in the (001) family. However, Fox is silent as to the percentage of domains that are functionally oriented with respect to the capacitor stack. The Examiner appears to argue that a crystallization texture of <001> inherently means that 100% of the domains are functionally oriented with respect to the capacitor stack. This is incorrect. Fox uses a given crystallographic orientation label such as <001> when "some component of the spontaneous polarization is aligned with the direction of the applied field (e.g., <111>, <001> or RND)." (Col. 2, lines 24-29). Furthermore, Fox teaches that "polycrystalline PZT films having the {100} crystalline planes parallel to the substrate surface are said to be <100> textured. Films composed of crystallites that, on average, have no specific crystallographic orientation relative to the substrate surface are said to be randomly oriented." (Col. 1, lines 59-64) In other words, when there is, on average, no specific crystallographic orientation, the films are referred to as randomly oriented. Otherwise,

the films are referred to as, for example, <100> textured. A given texture does not, therefore, imply 100% of the domains are functionally oriented with respect to the capacitor stack, as argued by the Examiner. Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are patentable over the references.

Applicant respectfully submits that dependent claim 3 is further patentable over the references as there is no disclosure or suggestion in the references of the PZT of each core having a switched polarization of at least about $60 \mu\text{C}/\text{cm}^2$. Fox discloses a switched polarization of around $25 \mu\text{C}/\text{cm}^2$ (Fig. 6). Higher switched polarization allows for smaller and more densely packed memory cells (page 5, lines 18-19).

Applicant respectfully submits that dependent claim 21 is further allowable. Claim 21 further requires that the conductive contacts each have a cross section about as large or larger than that of the ferroelectric cores and extend through the dielectric layer to a metal interconnect layer. Uchiyama teaches a metal interconnect form on the top electrode rather than a conductive contact that extends to a metal interconnect.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-6 and 21. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,

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